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MEMORANDUM FOR : Deputy Director, Science and Technology

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SUBJECT : Suggested Areas of Research for ☐

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1. During the 19 September staff meeting, you requested that each component within DD/STY examine their areas of scientific investigations to see if such areas could be further supported and expedited by the disciplines and level of competence available at ☐ Examination of areas of interest in OSA has indicated a number of problems which can be expedited by preliminary studies at the research level.

2. Suggested areas of research which could provide the test inputs to improve operations capabilities in the near future would include:

a. A study to define optimum bandwidths for ionospheric propagation of pulsed communications signals. The types of signals would include audio to binary conversion for burst-type pulsed communications transmissions and digital coding of pulse trains including address to classify data content and form in burst-type pulsed transmissions. Such a study should also include total and instantaneous bandwidths of frequency diversity system applications in the HF frequency ranges.

b. A study to define optimum coding for secure communications of voice and data in short-burst, pulsed transmission in HF and VHF frequency ranges.

c. High temperature materials and applications research (500°F to 650°F) oriented to solid-state electronic components.

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c. Research in cooling techniques for electronics, fuels, and electrical equipments on OLCART and TAGBOARD with efficiency, size, and weight particular targets for improvement. Temperature environment again is in 500°F to 650°F regime.

d. Consultative work on satellite detectability problems, particularly in the low radar cross-section areas.

f. Efforts on communications equipment, particularly ground equipments, for use in proposed communications satellite.

g. Studies on suitable shapes for low radar cross-section aerodynamic vehicles.

h. Applications of information theory, correlation techniques, etc., to improvements in data recording and transmitting.

i. Other problems in the sciences might well be applicable, e.g., aero-thermo-optical problems associated with low altitude satellites.

3. While materials research indicated in Item c., above, and research in cooling techniques in Item d., above, may be far afield, it is felt that other suggested areas of research are well within the disciplines available at

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JACK C. LEDFORD  
COLONEL USAF  
Assistant Director  
(Special Activities)

John Parangosky:D/TECH/OSA:haj (2 October 1963)

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